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## ***ROLE OF ADULT ATTACHMENT IN THE INTERGENERATIONAL TRANSMISSION OF VIOLENCE: MEDIATOR, MODERATOR, OR INDEPENDENT PREDICTOR?***

*L. L. Merrill  
C. J. Thomsen  
J. L. Crouch  
P. May  
S. R. Gold  
J. S. Milner*

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NAVAL HEALTH RESEARCH CENTER  
P. O. BOX 85122  
SAN DIEGO, CA 92186-5122

BUREAU OF MEDICINE AND SURGERY (M2)  
2300 E ST. NW  
WASHINGTON, DC 20372-5300



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Lex L. Merrill

Cynthia J. Thomsen

Julie L. Crouch

Patricia May

Steven R. Gold

Joel S. Milner

Naval Health Research Center  
P.O. 85122  
San Diego, CA 92186-5122

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## Abstract

**Problem:** The associations between different forms of childhood violence (parental and nonparental child physical abuse [CPA], parental and nonparental child sexual abuse [CSA], and domestic violence [DV]) and adult CPA risk have not been thoroughly examined. A study is needed to examine the effects of different forms of childhood violence on both adult attachment and adult CPA risk to determine if they are additive, interactive, or redundant, and whether they could be accounted for by (or varied depending on) associated demographic factors (e.g., sex, ethnicity, socioeconomic status). Additionally, three possible roles for adult attachment—as mediator or moderator of interpersonal violence effects, or as an independent predictor of adult CPA risk—have not been addressed in a large and demographically diverse sample of young men and women.

**Objective:** (1) To examine the role of adult attachment in the intergenerational transmission of violence. (2) To assess the effects of exposure to several forms of childhood violence (CPA, CSA, DV) on adult CPA risk. (3) To examine whether adult attachment serves as a mediator or moderator of these relationships, or as an independent predictor of CPA risk.

**Approach:** During their first week of basic training, U.S. Navy recruits ( $N = 11,195$ ) completed a package of questionnaires assessing childhood violence, adult attachment, and adult CPA risk.

**Results:** Childhood violence (especially parental CPA and DV) and adult attachment (especially the self-attitude dimension) were both predictive of increased adult CPA risk. Effects of childhood violence on CPA risk were partially but not entirely mediated by adult attachment. In contrast, there was no evidence that adult attachment or demographic factors moderated the relationship between childhood violence and adult CPA risk.

**Conclusion:** Some researchers have suggested that the identification of mediators or moderators of the relationship between childhood abuse and detrimental outcomes is likely to assist in the development of therapeutic interventions, because these factors are likely to be more readily modifiable than the abuse itself. Other predictors of negative outcomes, even if they are not known mediators or moderators of the relationship between childhood violence and adult CPA risk may also be candidates for interventions, regardless of whether they play a role in the intergenerational transmission of violence. Because insecure adult attachment is associated with adult CPA risk, interventions that effectively increase the positivity of other-attitudes and (especially) self-attitudes may reduce adult CPA risk, regardless of whether the individual experienced childhood violence. This will occur, however, only if a causal relationship between adult attachment and adult CPA risk exists, which is unknown. Intervention research demonstrating that changes in a predictor, such as adult attachment, produce changes in an outcome, such as CPA risk, would constitute indirect support for the causal role of the predictor.

## Role of Adult Attachment in the Intergenerational Transmission of Violence: Mediator, Moderator, or Independent Predictor?

According to the intergenerational transmission of violence (ITV) hypothesis, individuals exposed to violence during childhood should be at increased risk of later perpetration of violent behavior. Despite a general consensus that linkages between childhood maltreatment and adult violent behavior exist, several important questions about these associations remain unresolved. First, there has been insufficient attention to the specificity versus generality of ITV effects (see Widom, 1989). In some cases, the ITV hypothesis has been broadly construed to imply that exposure to childhood violence should promote higher rates of adult violence. Researchers taking this approach have often used composite measures, incorporating diverse types of childhood violence into a single predictor (e.g., Styron & Janoff-Bulman, 1997; Wekerle & Wolfe, 1998) or diverse types of adult violence into a single outcome measure (e.g., Widom, 2000; Zurravin, McMillen, DePanfilis, & Risley-Curtiss, 1996) variable. Others have narrowly construed the ITV hypothesis, suggesting that exposure to a specific type of childhood violence should increase the likelihood of perpetrating that particular type of violence. Researchers taking this perspective have often focused on one form of childhood violence without considering the effects of other forms of maltreatment (e.g., Choice, Lamke, & Pittman, 1995; Herrenkohl, Herrenkohl, & Toedter, 1983; Jankowski, Leitenberg, Henning, & Coffey, 1999).

For purposes of determining the unique and common effects of different types of childhood violence, both approaches are problematic. Because different forms of childhood abuse often co-occur and because different forms of abuse may have similar effects, the role

of different types of childhood violence in producing an outcome can be determined only if several types are examined simultaneously (Briere & Runtz, 1990). Thus, the present study examined the independent and combined effects of several different types of childhood violence—child physical abuse (CPA), child sexual abuse (CSA), and domestic violence (DV)—on a single outcome variable: adult risk of CPA perpetration. Beyond allowing for a determination of the unique effects of specific types of childhood violence (i.e., controlling for the effects of other concurrent forms of violence), the inclusion of multiple forms of childhood violence in a single study makes possible the examination of whether their effects on CPA risk are redundant, additive, or multiplicative.

Substantial research has examined the ITV hypothesis with respect to CPA victimization–CPA perpetration linkages, and the evidence has generally been supportive. CPA history is associated with adult CPA risk whether the latter is defined in terms of alleged or substantiated CPA perpetration (e.g., Coohey & Braun, 1997; Straus & Kantor, 1994; for reviews, see Kaufman & Zigler, 1987; Simons & Johnson, 1998; Widom, 1989) or scores on validated measures of adult CPA risk such as the Child Abuse Potential (CAP) Inventory (Milner, 1986, 1994; e.g., Crouch, Milner, & Thomsen, 2001; Miller, Handal, Gilner, & Cross, 1991; Milner, Robertson, & Rogers, 1990). Although there has been less attention to the effects of other forms of childhood violence on adult CPA risk, there is some evidence that CSA and DV, when examined independently, are also associated with higher scores on the CAP Inventory (DePaul, Milner, & Mugica, 1995; Miller et al., 1991; Milner et al., 1990). Seldom, however, have researchers simultaneously examined the effects of different types of childhood violence on adult CPA risk, as we do in the present study (for exceptions, see Coohey & Braun, 1997; Doumas, Margolin, & John, 1994).

### *Mediation of ITV Effects*

A second issue that requires study involves the process by which the ITV effect occurs. That is, *how* does exposure to violence in childhood increase the likelihood of violent behavior in adulthood? The most common explanation invokes social learning theory (Bandura, 1973), which posits that individuals learn maladaptive behaviors through modeling the behavior of referent adults. Other possibilities—not necessarily incompatible with the social learning framework—have also been advanced. These include effects of childhood violence on attitudes (e.g., Alexander, Moore, & Alexander, 2001; Markowitz, 2001); self-esteem, self-confidence, or self-control (e.g., Avakame, 1998; Cole, Woolger, Power, & Smith, 1992); physiological reactivity (e.g., Widom, 2000); coping behavior and conflict resolution strategies (e.g., Choice et al., 1995; Widom, 2000); personality variables (e.g., Simons & Johnson, 1998); and dissociation and other forms of psychological maladjustment (e.g., Egeland & Susman-Stillman, 1997). Still other proposed mechanisms focus on the possibility that childhood violence may have strong and lasting effects on the victim's expectations, beliefs, and behaviors in interpersonal relationships (e.g., Murphy & Blumenthal, 2000). In particular, attachment theory has garnered increasing interest as a framework for understanding the mechanisms responsible for ITV effects (e.g., Alexander, 1992; Cole-Detke & Kobak, 1998; Morton & Browne, 1998; Zeanah & Zeanah, 1989). In the present study, we examined the possibility that attachment mediates the ITV effect in the context of predicting adult CPA risk.

According to attachment theory (Bowlby, 1969, 1973, 1980), infants develop expectations about interpersonal relationships based on their early interactions with caregivers. Specifically, when caregivers are available, responsive, and sensitive to the

child's needs, the child is likely to develop secure attachment. In contrast, caregivers who are withdrawn, insensitive, hostile, or inconsistent in their behavior toward the infant are likely to produce insecure attachment (e.g., Ainsworth, Blehar, Waters, & Wall, 1978; Egeland & Farber, 1984). These early experiences are proposed to influence the individual's cognitive schemas or "internal working models" of relationships (Bowlby, 1973; George & Solomon, 1996), with securely attached infants developing positive schemas for both self (e.g., "I am lovable") and others (e.g., "Others are well-intentioned"), and insecurely attached infants acquiring negative working models of the self, others, or both. These schemas may initiate a self-perpetuating process by which the individual selectively seeks out and interprets his or her future interactions and relationships with others in a manner consistent with his or her expectations. In this way, the attitudes toward the self and others formed during early infancy may be maintained and reinforced, influencing cognitions, emotions, and behavior in relation to significant others throughout childhood and adulthood (Bowlby, 1980; Crittenden & Ainsworth, 1989).

The role of attachment in ITV can also be understood within the framework of Milner's (1993, 2000) social information processing (SIP) model of CPA. According to the SIP model, preexisting information structures or schemata provide parents with expectations that guide their interpretation of children's behavior and thereby influence their parenting behavior. Such schemata are acquired, in part, in the family of origin, and constitute a mechanism by which childhood experiences may influence adult parenting behavior. Milner described various kinds of schemata that may function in this manner, including schemata summarizing beliefs about oneself and others that are similar to the internal working models described by attachment theorists.

If attachment mediates ITV, several conditions must exist: (1) childhood violence must predict insecure attachment, (2) insecure attachment must predict adult CPA risk, and (3) the direct relationship between childhood violence and adult CPA risk must be attenuated or eliminated when attachment is controlled (Baron & Kenny, 1986; Holmbeck, 1997).

Although a number of studies have addressed the first condition, only one has addressed the second, and none have addressed the third. In the one study that examined the relationship between adult attachment and CPA risk, Moncher (1996) reported a significant relationship between insecure adult attachment and CPA risk (assessed using a composite of several risk measures) in a sample of 48 single, low socioeconomic status (SES) mothers. Importantly, however, this association was no longer statistically significant after controlling for family income.<sup>1</sup>

In contrast to the paucity of evidence on the association between adult attachment and CPA risk, a number of studies have confirmed that childhood violence predicts attachment in both children (assessed by observing their behavior during separations from and reunions with caregivers; for reviews see Cole-Detke & Kobak, 1998; Milner & Dopke, 1997; Morton & Browne, 1998) and adults (assessed using self-report measures; Coe, Dalenberg, Aransky, & Reto, 1995; Feldman & Downey, 1994; McCarthy & Taylor, 1999; Mickelson, Kessler, & Shaver, 1997; Roche, Runtz, & Hunter, 1999; Shapiro & Levendosky, 1999; Styron & Janoff-Bulman, 1997; Wekerele & Wolfe, 1998; Wiffen, Judd, & Aube, 1999). Results of these studies have been almost uniform in indicating a significant relationship between childhood violence and insecure attachment (but see Muller, Sicoli, & Lemieux, 2000).

Despite relatively consistent evidence that childhood maltreatment is related to both childhood and adult attachment, previous studies on this issue are not without flaws. Many

studies have not included demographically matched comparison groups or statistical controls for demographic differences between groups, nearly all of them either considered only one form of childhood maltreatment or combined multiple forms of maltreatment into a single variable (for exceptions in the infant/child attachment literature, see Browne & Saqi, 1988; Finzi, Cohen, Sapir, & Weizman, 2000). In the adult attachment literature, Mickelson et al. (1997) examined associations between attachment and several forms of childhood violence (CPA, CSA, child neglect, DV) in a national probability sample. Each type of childhood violence was significantly associated with adult attachment. However, since they examined only zero-order correlations between childhood violence and attachment (i.e., without controlling for co-occurrence among them or for demographic variables), it is impossible to determine the unique impact of each type of child abuse on adult attachment.

Two studies have simultaneously assessed the impact of multiple forms of childhood violence on adult attachment, allowing for an estimation of the unique effects of each type of violence while controlling for the other(s). In a sample of 512 male and female undergraduates, Gauthier, Stollak, Messe, and Aronoff (1996) found that both CPA and neglect were significantly associated with insecure adult attachment, and the effects of the two types of maltreatment were additive. In a study of 80 female adolescents, Shapiro and Levendosky (1999) found that a combined CPA/neglect variable was significantly associated with adult attachment whereas CSA was not. Overall, these studies suggest that various forms of childhood violence, when examined in isolation, are associated with adult attachment. However, CSA may no longer predict attachment once other forms of childhood violence are controlled; that is, the apparent association between CSA and adult attachment may be a spurious result of associations between CSA and other forms of childhood violence.

No studies have examined whether exposure to DV continues to predict childhood violence after controlling for other forms of childhood violence.

From a social learning perspective, CPA might be expected to have the strongest impact on adult CPA risk, since this would involve direct modeling of parental behavior. Because DV involves similar behaviors to CPA (e.g., hitting), albeit directed at a different target, imitation and modeling may also account for an association between childhood exposure to DV and adult CPA perpetration. However, the effect of DV should be weaker than that of CPA, since observed violence should be less impactful than violence actually experienced. Finally, because the behaviors involved in CSA are qualitatively distinct from the behaviors involved in CPA and DV, any effect of CSA on adult CPA risk should be weaker.

Of course, if different mechanisms—other than or in addition to social learning—are involved in ITV, these arguments do not necessarily apply. Briere and Runtz (1990) suggested that CPA (relative to CSA or neglect) should be most predictive of later aggression (with CSA associated with sexual problems and psychological abuse associated with low self-esteem). This implies that CPA should be a stronger predictor of a wide array of adult aggressive behaviors than the other forms of childhood abuse (although this framework does not incorporate DV). Partially consistent with this prediction, in prospective research by Widom and her colleagues (Widom & Ames, 1994) CPA and neglect victims were more likely than CSA victims to be arrested for violent crimes. However, other research has yielded results inconsistent with this prediction. For example, some studies have found that other forms of childhood violence, such as CSA or DV, are more powerful than CPA in predicting adult CPA risk (Doumas et al., 1994; Miller et al., 1991).

Other hypothesized explanatory mechanisms for ITV effects may differ in their predictions about the relative impact of different forms of childhood violence on adult violence. For example, if attachment disturbances constitute the primary mechanism for ITV effects, whichever form of childhood violence has the greatest impact on attachment would be predicted to have the greatest impact on adult CPA risk as well. Unfortunately, attachment theory is silent on the question of whether CPA, CSA, or DV should have stronger effects on adult attachment. However, it does suggest that violence committed by parents should have more profound effects on attachment than does violence committed by others, since parents are generally the primary attachment objects. Because Shapiro and Levendosky (1999) did not differentiate between parental and nonparental forms of CSA (but presumably considered only parental forms of CPA and neglect), their analysis may have underestimated the impact of CSA on adult attachment. In the present study, we compared the impact of parental and nonparental forms of both CPA and CSA on adult attachment and CPA risk, hypothesizing that parental forms would have stronger effects.

#### *Moderation and Independent Predictors of ITV Effects*

A third major issue in the ITV literature arises from mounting evidence that associations between childhood and adult violence are not as strong as had previously been assumed. The weight of the evidence now suggests that “the path between these two points is far from direct or inevitable” (Kaufman & Zigler, 1987, p. 190). In fact, based on their review of the literature, Kaufman and Zigler concluded that two thirds to three fourths of CPA victims do not physically abuse their own children. Moreover, some individuals who physically abuse their children or spouses appear to have no history of significant childhood violence (Straus, Gelles, & Steinmetz, 1980). These findings suggest that factors other than

childhood exposure to violence are important in determining which individuals will become violent adults.

Variables that help to predict which victims of childhood violence will become violent adults and which will not might serve as either moderators of the relationship between childhood and adult violence or as independent predictors of adult violence. If attachment moderates ITV, the impact of childhood violence on adult violence should vary depending on the quality of adult attachment (or, equivalently, the impact of adult attachment on adult violence should vary depending on the presence of childhood violence). For example, the relationship between childhood violence and adult CPA risk may be particularly strong for adults who are insecurely attached, or secure adult attachment may buffer individuals from the negative consequences of childhood violence, including increased adult CPA risk. In fact, several researchers have suggested that adult attachment may moderate ITV effects (e.g., Morton & Browne, 1998; Sroufe, Carlson, & Schulman, 1993; Styron & Janoff-Bulman, 1997; Wekerle & Wolfe, 1998).

In contrast, if adult attachment is an independent predictor of adult CPA risk, it operates outside the purview of ITV, predicting increased or decreased likelihood of adult violence regardless of the individual's maltreatment history. Statistically, then, moderation of ITV effects would be reflected by an interaction between childhood violence and attachment, whereas independent prediction would be indicated by a main effect of attachment on adult violence. Unfortunately, researchers have often failed to clearly distinguish between moderators and independent predictors, particularly in studies that do not include a comparison group of nonvictims. In such cases, researchers who identify a factor that is predictive of more positive or less negative outcomes for victims of childhood violence often

describe this factor as buffering the effects of childhood violence or helping to break the cycle of violence (e.g., Styron & Janoff-Bulman, 1997; Zuravin et al., 1996). Although these descriptions imply moderation, the variable may in fact be an independent predictor of adult violence (i.e., with equally salutary or deleterious effects for those who did not experience childhood violence and for those who did). Only by comparing the effects of adult attachment on the outcomes of victims versus nonvictims, as we do in the present study, can it be determined whether attachment functions as a moderator or as an independent predictor.

No previous studies have directly tested whether attachment moderates ITV in the context of CPA risk. However, one study examined whether adult attachment moderates ITV in the context of intimate partner violence. In a sample of 321 high school students, Wekerle and Wolfe (1998) found some evidence that the relationship between childhood violence (combining CPA, CSA, and observed violence) and abusive behavior toward romantic partners (combining verbal, physical, and sexual abuse) was moderated by adult attachment. For boys, but not for girls, the relationship between childhood maltreatment and abusive behavior was weaker for individuals who were securely attached than for those who were insecurely attached. To the extent that similar patterns exist in the prediction of adult CPA risk, these results suggest that adult attachment may moderate the ITV effect in that context as well, at least for males.

### *The Present Study*

The present study examined the associations between several forms of childhood violence (parental and nonparental CPA, parental and nonparental CSA, and DV) and adult CPA risk. We examined whether the effects of different forms of childhood violence on both adult attachment and adult CPA risk were additive, interactive, or redundant, and whether

they could be accounted for by (or varied depending on) associated demographic factors (e.g., sex, ethnicity, SES). Finally, we examined three possible roles for adult attachment: as mediator or moderator of IPV effects, or independent predictor of adult CPA risk. These issues were addressed in a large and demographically diverse sample of young men and women.

## METHOD

### *Participants*

Incoming female ( $n = 5,226$ ) and male ( $n = 5,969$ ) Navy recruits at the Recruit Training Center, Great Lakes, Illinois, voluntarily completed a set of survey instruments from June 1996 through June 1997. Overall, 96.5% of the men and 95.5% of the women participated. Across groups of participants, participation rates ranged from 59% to 100%. Variations in sample size due to missing and/or invalid data on specific measures are reflected in the  $N$ s reported for individual analyses. Participants ranged in age from 17 to 35 years, with 70% being between 18 and 20 years of age ( $M = 19.77$  years,  $SD = 2.62$ ,  $N = 10,731$ ). The vast majority (89%) were single, with 6% married, 3% cohabiting, and 2% divorced or separated ( $N = 11,138$ ). Most participants had completed high school or the equivalent (86%), with smaller numbers reporting no high school degree (5%) or some college (9%;  $N = 11,164$ ). Participants were diverse in ethnicity, with 61% White, 19% African American, 11% Hispanic, and 9% other ( $N = 10,951$ ).

### *Measures*

*Child physical abuse (CPA).* Participants were classified in terms of whether they had experienced parental CPA (CPA-p) and nonparental CPA (CPA-n) based on their responses to the Parent-Child version of the Conflict Tactics Scale (CTS), Form R (Straus, 1990, p. 33).

The CTS contained 19 items, each representing a technique that adults might use to resolve a conflict with children. Ratings reflected the frequency with which each technique had been used on the respondent during the worst year of his or her life before age 18, and were made on a 7-point scale anchored by 0 and 20+. Similar forms of the CTS have been used in many studies of abuse sequelae (e.g., Downs, Miller, Testa, & Panek, 1992; Hartz, 1995; Milner et al., 1990; Riggs, O'Leary, & Breslin, 1990; Widom & Shepard, 1996).

Respondents rated each item twice, first with reference to their parents/stepparents and then with reference to any other adults living in their homes. Of primary relevance to the present study were the seven items that assessed how often the referent adults used severe or very severe physical violence (e.g., hitting, choking, burning) against the participant. Respondents were classified as having experienced CPA-p (CPA-n) if they reported that they had ever experienced any of the severe or very severe forms of violence at the hands of the parents or stepparents (other adults).

Severity of CPA was assessed (separately for CPA-p and CPA-n) in terms of both frequency of CPA and the frequency of resulting injury. Frequency of CPA was computed by summing responses to the 7 relevant CTS items; frequency of injury was assessed using the Childhood History Questionnaire (CHQ; Milner et al., 1990). The CHQ has been successfully used as a measure of CPA in previous studies (e.g., Crouch, Milner, & Caliso, 1995; Crouch et al., 2001; De Paul et al., 1995; Gold, 1991; Litty, Kowalski, & Minor, 1996; Narang & Contreras, 2000; Schaaf & McCanne, 1998; Thakkar, Gutierrez, Kuczen, & McCanne, 2000). The CHQ items included in the present study asked respondents to rate the frequency with which they had received five different types of injuries (e.g., burns, bruises, broken bones) before the age of 18. Items were completed twice, first with reference to

parents/stepparents and then with reference to other adults. Ratings were made using the same 7-point response format used for the CTS, and responses were summed to create indices reflecting frequency of injury.

*Child sexual abuse (CSA).* Childhood sexual experiences were assessed using a modified version of the Sexual Events Questionnaire (Finkelhor, 1979). Respondents were asked to indicate whether they had sexual experiences before the age of 18 with a family member or with someone unrelated who was at least 5 years older. Those who answered in the affirmative were asked to provide details about these experiences, including type of CSA (sexual kissing or touching versus oral, anal, or vaginal intercourse); relationship to the perpetrator; the respondent's own age and the age of the perpetrator when it first happened; whether physical force or threats had been involved; and the total number of times it happened (on a scale ranging from 0 to 99). Participants were classified as having experienced CSA if they reported one or more contact sexual experiences before the age of 14 with a parent or stepparent. They were classified as having experienced CSA-n if they reported a contact sexual experience before age 14 with someone other than a parent who was at least 5 years older. The number of instances of CSA the respondent reported, whether force was involved, and type of CSA (touching versus intercourse) served as indices of CSA severity.

*Domestic Violence (DV).* DV was assessed using 6 items adapted from items previously used in a national survey of college students (Koss, Gidycz, & Wisniewski, 1987). Respondents rated how many times "things like hitting, kicking, throwing someone down, biting, or choking" had occurred between their parents or stepparents, or between a parent and his or her romantic partner, while the respondent was growing up. Responses were made

on a scale ranging from 0 to 18+. Respondents were defined as having been exposed to DV if they reported any event meeting the definition described above. An index of DV severity was constructed by summing the number of reported incidents across the 6 items.

*Adult attachment.* Adult attachment was assessed using the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991; Griffin & Bartholomew, 1994). The RQ consists of four brief paragraphs, each describing individuals with a different attachment style (secure, dismissing, preoccupied, or fearful). Respondents rated the extent to which each description was self-descriptive, using a 7-point scale (1 = *not at all like me*, 7 = *extremely like me*). The four attachment styles described in the RQ vary in terms of both the valence of attitudes toward the self and the valence of attitudes toward others that they represent. Specifically, secure attachment is marked by positive attitudes toward both self and others, dismissing attachment implies positive self-attitudes and negative attitudes toward others, preoccupied attachment is indicative of negative self-attitudes and positive other-attitudes, and fearful attachment indicates negative attitudes toward both self and others.

Separate indices of the valence of attitudes toward the self and others were constructed by summing ratings of the two styles representing positive attitudes toward each entity (i.e., self or other), and subtracting the sum of ratings of the two styles representing negative attitudes toward that entity. These dimensional scores were also used to classify individuals in terms of their attachment style, based on whether scores on the self-attitude and other-attitude dimensions were positive (above the scale midpoint) or negative (at or below the midpoint; Griffin & Bartholomew, 1994). Dimensional scores have several advantages over categorical indices (Fraley & Waller, 1998), and evidence suggests that the

same two dimensions underlie most self-report measures of adult attachment (Brennan, Clark, & Shaver, 1998). Therefore, in our analyses we relied on the dimensional measures, reporting information about adult attachment categories only for descriptive purposes.

*Adult CPA risk.* Our index of adult CPA risk was the physical abuse scale of the CAP Inventory (Milner, 1986, 1994). The CAP Inventory is a 160-item questionnaire that employs an agree/disagree format. In the present study, women completed the standard CAP Inventory, whereas men completed the same 160 items, but in a different order and embedded within a longer (340-item) scale. CAP Inventory physical abuse scale scores are computed as a weighted sum of responses to 77 scale items ( $\alpha = .89$ ). For respondents with missing data for 10% or fewer of the physical abuse scale items, missing responses were replaced with respondents' own mean across the completed scale items. Respondents who failed to complete more than 10% of the items on the CAP abuse scale were excluded from all analyses involving the CAP; this resulted in the exclusion of 30% of cases ( $n = 3,317$ ).<sup>2</sup>

The expected relationships between risk factors for CPA perpetration and scores on the CAP physical abuse scale have been confirmed in several studies (Milner, 1986, 1994). Concurrent validity studies report correct classification of abusers and nonabusers at rates ranging from 80% to 90% (Milner, 1986). In addition, predictive validity data indicate that elevated CAP abuse scores are significantly related to later confirmed cases of child physical abuse (Milner, Gold, Ayoub, & Jacewitz, 1984; Valle, Chaffin, & BigFoot, 2000) and to future negative child outcomes (e.g., developmental delays, Dukewich, Borkowski, & Whitman, 1999; and morbidity, Zelenko et al., 2001). Temporal stability (test-retest reliability) estimates for the CAP physical abuse scale were .91 and .75 for 1-day to 3-month intervals, respectively (Milner, 1986).

### *Procedure*

The questionnaires used in the present study were part of a more extensive survey package that was offered to Navy recruits during their first week at the Recruit Training Center. Nonmilitary personnel of the same sex as participants administered the survey package in a classroom setting to groups of male or female recruits. Participation was voluntary. Before agreeing to participate, recruits were provided with a description of the study, a Privacy Act statement, and an informed consent form describing their rights as participants, including the right to “leave blank any section or questions” and to “stop at any time before completing the survey.”

Respondents were randomly assigned to complete the survey under anonymous ( $n = 5,697$ ) or identified ( $n = 5,498$ ) conditions. Those in the anonymous condition were informed that their responses would be completely anonymous, and they were not asked to provide identifying information. Those in the identified condition were informed that their responses would be completely confidential but not anonymous, and these participants were asked to provide identifying information. In all other respects, the experiences of participants in the two conditions were identical.

### Results

The distributions of all variables indexing frequency of childhood violence (CPA, injury, CSA, DV) exhibited significant departures from normality and therefore were subjected to logarithmic transformations. For clarity of presentation, however, we present descriptive information for all variables in terms of their original response metrics. To reduce the risk of Type I error and to compensate for the high level of power engendered by our large sample size, all hypotheses were evaluated using  $\alpha = .01$  as the criterion for

significance unless otherwise noted. To provide information about the magnitude of effects independent of sample size, we provide effect size indices ( $\phi$ ,  $r$ ) where possible; these indices range from 0 to 1, with a value of .10 considered small, .30 moderate, and .50 large (Cohen, 1988).

### *Childhood Exposure to Violence*

Table 1 provides information about rates and characteristics of CPA, CSA, and DV in our sample. As can be seen in the table, CPA-p was more common than CPA-n, whereas CSA-n was more common than CSA-p. Overall, CPA-p was the most commonly reported type of childhood violence (38%), followed by DV (33%) and CSA-n (17%).

Descriptive information about the characteristics of each type of violence was based only on individuals who reported that type of violence. Because the frequencies of different types of childhood violence were assessed on different scales, it is not possible to directly compare frequencies across different types of violence. However, CPA-p and CPA-n were measured on the same scale, as were CSA-p and CSA-n; thus the severity of parental and nonparental forms of these two types of abuse can be compared. Parental forms of abuse were generally more severe than nonparental forms. Comparing those with either CPA-p or CPA-n, both the frequency of CPA and the frequency of injuries were higher for parental than for nonparental abuse,  $F(1, 3261) = 18.70, r = .08$ , and  $F(1, 3259) = 29.98, r = .10, p < .001$ . Similarly, comparing those with either CSA-p or CSA-n, parental CSA was both more frequent and more likely to involve force,  $F(1, 1431) = 43.42, r = .17$ , and  $\chi^2(1, N = 1488) = 19.46, p < .001, \phi' = .11$ , although CSA-p and CSA-n recipients did not differ in type of CSA (i.e., touching vs. intercourse),  $\chi^2(1, N = 1480) = 1.64, \phi' = .03, p > .20$ . Similarly, within-subjects comparisons of the severity of parental versus nonparental CPA (for those

who had experienced both) and CSA revealed that parental abuse was more severe than nonparental abuse.

The occurrence of different types of child violence was not independent. Table 2 provides likelihood ratio  $\chi^2$  tests of the associations among different types of violence. At the zero-order level, all of these associations were significant ( $p < .001$ ), indicating that individuals who experienced one form of violence were at increased risk of experiencing the others. The relationship between CPA-p and DV was moderate in size ( $\phi = .28$ ), with other relationships between forms of childhood violence being smaller ( $.04 \leq \phi \leq .18$ ). As would be expected, partial  $\chi^2$  values, obtained using hierarchical loglinear analysis with demographic controls, were uniformly smaller than zero-order coefficients; after controlling for other variables, 4 of the 10 associations between different types of childhood violence were no longer statistically significant (see Table 2).<sup>3</sup>

Loglinear analysis revealed several statistically significant associations between demographic variables and the occurrence of specific types of childhood violence. The strongest effects were sex differences in rates of CSA,  $\chi^2_{\text{partial}} (1, N = 7,474) = 175.05$  and 272.92, for CSA-p and CSA-n, respectively. Consistent with previous research (e.g., Milner et al., 1990), females were more likely than males to report CSA. Ethnicity was significantly associated with both CPA variables,  $\chi^2_{\text{partial}} (1, N = 7,474) = 78.06$  and 21.53 for CPA-p and CPA-n, respectively, with White respondents being less likely than African American or Hispanic respondents to report CPA in both cases. Finally, SES was significantly associated with DV,  $\chi^2_{\text{partial}} (1, N = 7,474) = 51.49$ , with higher SES respondents being less likely to report DV.

The hierarchical loglinear analysis also allowed us to examine whether associations between different types of violence differed for different demographic subgroups. This was not the case. None of the associations between different types of childhood abuse was modified by a significant higher-order interaction with ethnicity, education, SES, sex, marital status, age, or anonymity condition, nor were any 3-way interactions between different types of childhood violence significant. Thus, although members of some demographic groups were more likely than others to experience particular forms of childhood violence, across all demographic groups individuals who had experienced one form of childhood violence were at increased risk of experiencing other forms of violence.

#### *Childhood Violence and Adult Attachment*

The next set of analyses explored relationships between childhood violence and adult attachment style. The RQ, our measure of attachment, yields continuous measures of attitudes toward self and attitudes toward others (theoretical range: -12.0 through +12.0), as well as classifying respondents in terms of one of four attachment styles. On average, attitudes toward self ( $M = 1.40$ ,  $SD = 4.20$ ) were significantly more positive than attitudes toward others ( $M = 0.24$ ,  $SD = 4.80$ ),  $t(9,979) = 19.16$ ,  $p < .001$ . Respondents were fairly evenly distributed across adult attachment categories, with 30% secure, 25% dismissing, 18% preoccupied, and 27% fearful.

Associations between demographic factors and adult attachment were examined in two multiple regression analyses, one predicting each attachment dimension. Categorical predictors were first dummy coded, with the most common group (e.g., single for marital status; high school degree for education) serving as the comparison group. Together, the set of demographic predictors accounted for a small but significant proportion of the variance in

both self- and other-attitudes,  $R^2 = .007$  and  $.041$ , respectively,  $F(13, 9,221) = 5.02$  and  $30.65$ ,  $p < .001$ . Attitudes toward the self were significantly more positive among high SES respondents,  $b (SE) = 0.12 (0.03)$ , among older respondents,  $b (SE) = 0.06 (0.02)$ , among African American (vs. White) respondents,  $b (SE) = 0.46 (0.12)$ , and among married (vs. single) respondents,  $b (SE) = 0.53 (0.19)$ , all  $ps < .01$ . Attitudes toward others were more positive for males than females,  $b (SE) = -1.34 (0.10)$ , for younger respondents ( $b (SE) = -0.11 (0.02)$ , for married (vs. single) respondents,  $b (SE) = 0.64 (0.22)$ , and for Whites (vs. African Americans and those describing their ethnicity as “other”),  $b (SE) = -1.48 (0.14)$  and  $-0.60 (0.18)$ , respectively.

We next examined the associations between different forms of childhood violence and adult attachment. Table 3 provides zero-order point biserial correlations between the occurrence of each type of childhood violence and each of the two attachment dimensions. All relationships were small and negative, indicating a general tendency for respondents exposed to childhood violence to hold more negative attitudes toward both themselves and other people. Childhood violence generally had stronger associations with self-attitudes than with other-attitudes, and CPA-p was the strongest predictor of both attachment dimensions. The prediction that parental forms of abuse would have stronger effects on adult attachment than would nonparental forms was supported for CPA, but not for CSA.

Pearson correlations between the adult attachment dimensions and frequency of each type of childhood violence were similar in magnitude to those presented in Table 3. To examine whether more frequent exposure to violence had a greater effect than less frequent exposure among victims, Pearson correlations between severity and the attachment dimensions were computed after excluding respondents who did not report the particular

form of childhood violence. For DV only, greater frequency of exposure was associated with more negative self- and other-attitudes,  $rs = -.08$  and  $-.05$ . For CPA and CSA victims, more instances of abuse were not significantly predictive of more insecure attachment. Thus, for CPA and CSA, it appears that whether an individual experienced abuse has a greater impact on adult attachment than how frequently the individual was abused.

Table 3 also provides the results of two hierarchical multiple regression analyses in which the attachment dimensions were regressed on the childhood violence variables, after first entering the demographic variables. The regression coefficients resulting from this analysis thus estimated the impact of each type of childhood violence on the attachment dimensions after controlling for both demographic variables and other forms of childhood violence. For self-attitudes, the set of childhood violence variables significantly increased the percentage of explained variance beyond that accounted for by the demographic variables,  $R^2_{change} = .023$ ,  $F_{change} (5, 6,755) = 19.67$ ,  $p < .001$ . Both CPA-p and DV were significantly associated with less positive self-attitudes. The three remaining forms of childhood violence did not attain significance (although they approached significance;  $p \leq .02$ ). For other-attitudes, the childhood violence variables, when entered on the second step of the analysis, did not account for significant variance,  $R^2_{change} = .001$ ,  $F_{change} (5, 6,755) = 1.30$ ,  $p > .20$ . The only type of childhood violence to approach significance as a predictor of negative other-attitudes was CPA-p ( $p < .02$ ).

To determine whether the effects of childhood violence on adult attachment varied across demographic groups, we conducted additional regression analyses in which 2-way interactions between each demographic variable and each childhood violence variable were entered on the third step. The set of interaction variables did not significantly contribute to

prediction for either self- or other-attitudes,  $R^2_{change} = .007$  and  $.010$ , respectively,  $F_{change} (56, 6,699) \leq 1.30$ , *n.s.* The results of these multivariate analyses indicate that CPA-p and DV were independently and additively related to attachment, with CPA-p having the stronger effect, and that childhood violence impacted attitudes toward the self more than attitudes toward others.

#### *Childhood Violence and Adult Attachment as Predictors of Adult CPA Risk*

Our measure of adult CPA risk, the CAP Inventory physical abuse scale, yielded a sample mean of  $167.16$  ( $SD = 96.31$ ,  $N = 7,878$ ). Using a conservative cutoff score of  $215$  recommended by Milner (1986),  $30\%$  of the sample was classified as at risk for CPA perpetration. Of respondents with complete data on the CAP abuse scale ( $N = 7,878$ ),  $21\%$  were classified as faking good,  $2\%$  as faking bad, and  $8\%$  as randomly responding using the validity scales of the CAP. After eliminating respondents with invalid profiles, the mean was slightly higher ( $M = 174.14$ ,  $SD = 96.25$ ,  $N = 4,812$ ), with  $32\%$  of the sample classified as at risk for CPA perpetration.

Respondents with invalid profiles differed in several respects from those with valid profiles. Not surprisingly, those classified as faking good were less likely to report childhood violence,  $-.02 \leq r \leq -.12$ , scored lower on the CAP abuse scale,  $r = -.25$ , and reported more positive attitudes toward self and others,  $r = .15$  and  $.03$ , respectively. All of these correlations but one ( $r = -.02$ , with CSA-p) were statistically significant ( $\alpha < .01$ ). Faking bad was significantly correlated only with CSA-p ( $r = .04$ ). Finally, individuals classified as responding randomly scored significantly higher on the CAP abuse scale ( $r = .18$ ), were more likely to report CPA-n ( $r = .06$ ), were less likely to report CSA-n ( $r = -.04$ ), and exhibited more negative attitudes toward self ( $r = -.04$ ; all  $p < .01$ ). Because validity was related to

several of our key variables, we conducted all analyses in two ways: using all cases with complete data on the CAP abuse scale, and using only those with valid profiles. We report only results based on the subset of cases with valid profiles except where results of the two analyses differed.

The set of demographic variables accounted for 2.9% of the variance in CAP abuse scores. Respondents in the anonymous condition had higher CAP abuse scores than those in the identified condition,  $b (SE) = 11.95 (2.84)$ , younger respondents had higher scores than older respondents,  $b (SE) = -2.06 (0.71)$ , low SES respondents scored higher than high SES respondents,  $b (SE) = -7.07 (0.86)$ , and cohabiting respondents scored higher than single respondents,  $b (SE) = 25.62 (7.47)$ , all  $p < .01$ .<sup>4</sup>

Examination of the independent associations of each form of childhood violence to adult CPA risk revealed significant associations in every case (see Table 4). Each type of childhood violence was significantly associated with adult CPA risk ( $p < .001$ ). In terms of simple odds ratios (ORs), individuals exposed to any form of childhood violence, compared with those who were not, were approximately 2 times more likely to be classified as at high risk for CPA perpetration (ORs = 2.24 for CPA-p, 2.18 for CPA-n, 1.89 for CSA-p, 1.86 for CSA-n, 1.76 for DV). The 99% confidence intervals (CIs) for these ORs overlapped, indicating that the effects of different forms of childhood violence on adult CPA risk status were not significantly different.

When Pearson correlations were computed between the frequency of each type of violence and CAP abuse scale scores, they were similar in magnitude to the point-biserial correlations in Table 4, and all remained significant. When Pearson correlations between frequency of violence and CPA risk were computed only for participants who experienced

each type of violence, all were significant except for CSA-p ( $r = -.10, p > .20$ ). Except for CSA-p, the results of these correlational analyses suggest both that those exposed to each form of violence are at increased risk of adult CPA, and that increased frequency of exposure to each form of violence also increases CPA risk.

As can be seen in Table 4, the simple associations between the two attachment dimensions and the CAP abuse scale were both significant ( $p < .001$ ). Negative attitudes toward self and others were both associated with heightened risk of adult CPA. In terms of the categorical measure of attachment style, all three forms of insecure attachment were associated with heightened likelihood of adult CPA risk, relative to secure attachment. However, dismissing attachment was associated with an OR of only 1.37 (99% CI, 1.06–1.77), whereas preoccupied and fearful attachment were associated with significantly greater likelihood of being classified as at high risk for adult CPA perpetration. For preoccupied attachment, the OR was 3.45 (99% CI, 2.68–4.45); for fearful attachment, the OR was 4.59 (99% CI, 3.65–5.77). Thus, at the zero-order level, fearful attachment was the strongest predictor of adult CPA risk; individuals with fearful attachment were 4.59 times more likely than individuals with secure attachment to be classified as at high risk for adult CPA.

Separate regressions were conducted predicting CAP abuse scores from childhood violence and from the adult attachment dimensions. In each case, the demographic variables were entered on the first step of the analysis, and the focal predictors were entered on the second step. The set of childhood abuse variables accounted for an additional 5.9% of the variance in adult abuse risk after controlling for demographics,  $F_{change}(5, 3363) = 43.98, p < .001$ . As can be seen in Table 4, each form of childhood violence remained a significant predictor of adult CPA risk, even after controlling for demographics and other forms of

abuse. Similarly, both adult attachment dimensions contributed significantly to the prediction of adult CPA risk even after controlling for the demographic variables,  $R^2_{change} = .163$ ,  $F_{change} (2, 4399) = 443.52$ ,  $p < .001$ .

*Does Adult Attachment Play a Role in the Relationship Between Childhood Violence and Adult CPA Risk?*

Thus far, we have demonstrated that childhood violence is associated with insecure adult attachment, and that both childhood violence and insecure adult attachment are predictive of adult CPA risk. The final set of analyses examined two possible roles of adult attachment with respect to the relationship between childhood abuse and adult CPA risk. Specifically, we examined whether adult attachment *moderates* or *mediates* the childhood abuse–adult CPA risk relationship. If adult attachment moderates the relationship between childhood abuse and adult CPA risk, the relationship between childhood abuse and adult CPA risk differs depending on the individual’s attachment, as indicated by a significant interaction between one or more types of abuse and attachment in predicting CPA risk. In contrast, if adult attachment mediates the relationship between childhood violence and adult CPA risk, childhood abuse is related to adult CPA risk in part because childhood abuse leads to insecure adult attachment, and insecure adult attachment leads to increased adult CPA risk. In this case, the strength of the relationship between childhood abuse and adult CPA risk should be eliminated or attenuated when adult attachment is statistically controlled. We explored each of these possibilities.

To examine whether effects of childhood violence on adult CPA risk were moderated by adult attachment, we conducted a regression analysis in which demographic variables were entered on the first step, childhood violence and attachment variables were entered on

the second step, and their 2-way interactions were entered on the third step. There was no evidence of moderation; the set of 2-way interactions did not explain significant additional variance above that explained by the main effects,  $R^2_{change} = .003$ ,  $F_{change} (10, 3310) = 1.28$ ,  $p > .23$ .

To examine whether associations between specific forms of childhood violence and adult CPA risk were moderated by demographic variables, we conducted additional hierarchical regression analyses, parallel to those described above, in which all 2-way interactions between demographic factors and the criteria variables were entered on the third step of the analyses. In neither case did the 2-way interactions contribute significantly to prediction, for childhood violence  $R^2 = .021$ ,  $F (65, 3298) = 1.20$ ,  $p > .12$ ; for attachment,  $R^2 = .004$ ,  $F (26, 4373) = 0.88$ ,  $p > .63$ . Similarly, entering the 2-way interactions between the childhood violence variables or between the adult attachment dimensions on the third step of the analysis did not account for significant variance beyond that accounted for by the main effects, for childhood violence  $R^2_{change} = .003$ ,  $F_{change} (9, 3354) = 1.40$ ,  $p > .18$ , for attachment  $R^2_{change} = .000$ ,  $F_{change} (1, 4398) = 0.30$ ,  $p > .58$ .

As a group, the results of these analyses indicate that the effects of childhood violence and adult attachment on adult CPA risk were not moderated by demographic variables nor by higher-order interactions with other forms of childhood abuse or attachment dimensions. Thus, secure adult attachment did not appear to buffer individuals against the effects of childhood abuse on adult CPA risk, nor did negative forms of adult attachment appear to exacerbate the effects of childhood abuse in increasing the likelihood of later abuse. Instead, childhood violence and adult attachment had largely independent and additive effects on the adult risk of committing CPA.

The final set of analyses examined whether adult attachment mediates the relationship between childhood violence and adult CPA risk. The analyses thus far suggest that this is a possibility only for CPA-p and DV. That is, although all forms of childhood violence were associated with increased adult CPA risk, only CPA-p and DV were associated with insecure forms of adult attachment—specifically, negative self-attitudes—once other forms of childhood violence and demographic variables were controlled. However, because the other forms of childhood violence were found to have direct effects on adult CPA risk in the analyses reported above, the path analysis included all five childhood violence variables as predictors, both dimensions of attachment as mediating variables, and adult CPA abuse risk as the criterion variable. The correlations used in testing this model are provided in Table 5.

A test of the full saturated model, depicted in Figure 1, revealed no significant effects of CPA-n or CSA-p on attachment or adult CPA risk. As in previous analyses, attitudes toward self were significantly influenced only by CPA-p and DV, and attitudes toward others were not significantly influenced by any form of childhood violence, although the effect of CPA-p approached significance ( $.01 < p < .05$ ). There were also significant direct effects of self- and other-attitudes, CPA-p, DV, and CSA-n on CAP scores. The reduced model, which included only those effects that were significant or marginally significant in the test of the full model, provided a good fit to the data,  $\chi^2 (3, N = 3453) = 2.49, p = .48$ , RMSEA = 0.0, AGFI = .998. Identical results were obtained when the model was fitted based on all available cases (i.e., including those categorized as having invalid profiles on the CAP;  $N = 5,615$ ). For comparison purposes, we fitted an alternative model in which the indirect effects included in the final model were set to zero (so that all variables had only direct effects on

adult CPA risk). This model did not provide as good a fit to the data,  $\chi^2$  (df=6,  $N$  = 3453) = 34.76,  $p < .001$ , RMSEA = .037, AGFI = .988,  $\chi^2_{\text{diff}}$  (df=3,  $N$  = 3453) = 32.28,  $p < .001$ .

Figure 2 depicts the final (reduced) model. All of the path coefficients in this model were significant. CPA-p had a significant direct effect on adult CPA risk as well as a significant indirect effect mediated through adult attachment (both self- and other-attitudes),  $b$  ( $SE$ ) = .025 (.007),  $t$  = 3.43,  $p < .001$ . Similarly, DV had both a direct effect on adult CPA risk and an indirect effect, mediated through the self-attitude dimension of adult attachment,  $b$  ( $SE$ ) = .018 (.007),  $t$  = 2.65,  $p < .01$ . Finally, CSA-n had only a direct effect on adult CPA risk. The lack of significant mediation of the effects of CSA-n is evident from the fact that it was not significantly related to either attachment dimension. In the final model, childhood violence accounted for only 1% of the variance in each of the adult attachment dimensions, corresponding to a small effect size of  $r$  = .10. In contrast, 22% of the variance in adult CPA risk was accounted for by the other explanatory variables, indicating a large combined effect of childhood violence and adult attachment on adult CPA risk ( $r$  = .47).

## Discussion

### *Attachment and Intergenerational Transmission of Violence*

The present study contributes to our understanding of ITV effects in several ways. First, our results have implications for the specificity versus generality of ITV effects. Although some previous research has shown that adult CPA risk is associated with other types of childhood violence besides CPA, including CSA (Miller et al., 1991; Milner et al., 1990) and DV (Doumas et al., 1994; Miller et al., 1991), none of these studies has simultaneously examined the impact of CPA, CSA, and DV on adult CPA risk. Our results provide some support for specificity in ITV effects. Consistent with social learning theory

(Bandura, 1973), CPA-p was a stronger predictor of adult CPA risk than the other forms of childhood violence we considered. However, as in some previous studies (Doumas et al., 1994; Miller et al., 1991), the impact of CPA-p on adult CPA risk was not significantly greater than the impact of the other types of childhood violence. In fact, all three forms of childhood violence independently contributed to the prediction of adult CPA risk, even after controlling for their interrelations and for demographic variables. On balance, then, our results provide greater support for generality than for specificity in ITV. It remains possible, however, that specificity of ITV effects will be found for types of adult violence other than CPA risk (e.g., DV; see Kalmuss, 1984).

The finding that several different types of childhood violence promote increased adult CPA risk to a similar degree suggests that some mechanism or mechanisms other than simple social learning must be implicated in the link between exposure to violence in one's youth and violence perpetration as an adult. Although it has been suggested that attachment may serve in this capacity (e.g., Alexander, 1992; Cole-Detke & Kobak, 1998; Morton & Browne, 1998; Zeanah & Zeanah, 1989), no previous studies have directly tested whether attachment mediates the relationship between childhood violence and adult CPA risk. In the first such test, the present study provides some support for a mediating role of attachment in ITV. Adult attachment was a significant mediator of the effects of both CPA-p and DV on adult CPA risk. This indicates that CPA-p and DV influence adult CPA risk, in part, because of their influence on individuals' orientations toward interpersonal relationships (i.e., their attitudes toward self and others). However, adult attachment provides only a partial explanation of the mechanism underlying ITV effects. In addition to their indirect effects (i.e., mediated through attachment), both CPA-p and DV also had direct (unmediated) effects

on adult CPA risk. Moreover, for both variables, direct effects on CPA risk were stronger than mediated effects; the proportion of the total effects of CPA-p and DV that was mediated was small (.13 and .19, respectively). Finally, adult attachment did not account for the impact of CSA-n on adult CPA risk; in the final model, CSA-n, had only direct (unmediated) effects.

It is not surprising that adult attachment cannot completely account for the relationship between childhood violence and adult CPA risk. It is clear ITV is a complex and multidetermined phenomenon, and we would not expect a single intervening process to explain the effect. Numerous other mediators of ITV have been proposed (Milner, 2000; Widom, 2000), and it is likely that many of them contribute to the ITV process as well. If this is the case, we can expect any single mediator to explain only a small portion of the ITV effect. Consistent with this view, previous studies of other mediators of ITV effects (e.g., self-control, Avakame, 1998; conflict resolution strategies, Choice et al., 1995) generally have found only partial mediation (but see Markowitz, 2001). In terms of the SIP model (Milner, 1993, 2000), the self- and other-attitude dimensions of adult attachment are only two among a potentially vast set of schemata implicated in parenting behavior. From this perspective, greater explanatory power is most likely to result from incorporating measures of other schemata (e.g., representing expectations about children's ability levels, control expectancies, self-efficacy, attributions about children's intentions) in addition to self- and other-attitudes. Studies that examine the role of individual mediators may be seen as building blocks toward the construction of a model that more completely describes the intervening processes responsible for ITV effects.

Consistent with previous research (for reviews, see Kaufman & Zigler, 1987; Widom, 1989), it was far from the case that exposure to childhood violence was invariably associated

with adult CPA risk. Among those who experienced one or more forms of childhood violence, 39% were classified as at risk for CPA perpetration (vs. 22% of those who reported no exposure to childhood violence). In the present study, we examined whether adult attachment could improve the prediction of adult CPA risk above and beyond childhood abuse variables. Specifically, we examined two distinct roles that adult attachment might play in predicting adult CPA perpetration: moderator or independent predictor. Previous studies have suggested a moderating role for attachment based on the finding that abuse victims who are securely attachment as adults demonstrate better outcomes than those who are insecurely attached (e.g., Schreiber & Lyddon, 1998; Styron & Janoff-Bulman, 1997). However, only by including a comparison group of nonabused individuals is it possible to determine whether attachment moderates the impact of childhood violence or whether it constitutes an independent predictor of outcomes, with equal effects for victims and nonvictims. The present results provide no support for a moderating role of attachment in ITV. Instead, adult attachment served as an independent predictor of adult CPA risk. That is, secure attachment was associated with lower CPA risk and insecure attachment was associated with higher CPA risk regardless of whether the individual had experienced childhood violence. Thus, although adult attachment was useful in predicting adult CPA risk, it did not buffer or exacerbate the effects of childhood violence on CPA risk.

### *Predictors of Adult CPA Risk*

Our final path model included three childhood violence variables and the two attachment dimensions as predictors of adult CAP risk. The two childhood violence variables that were dropped from the model were those that were least common among our respondents: CPA-n and CSA-p, reported by 5% and 4% of our sample, respectively.

Disregarding the distinction between parental and nonparental sources of abuse, however, all three forms of childhood violence remained significant predictors of CPA risk after adult attachment was incorporated in the model.

Only one previous study has demonstrated an association between CPA risk and self-reported adult attachment (Moncher, 1996); in Moncher's study, however, the effect was no longer significant after statistically controlling for group differences in SES. In contrast, in the present study we found relatively strong effects of adult attachment on adult CPA risk even after controlling for both demographic factors (including SES) and exposure to childhood violence. In fact, among the variables we considered, adult attachment was the strongest predictor of adult CPA risk.

In some respects, it is not surprising that adult attachment was a stronger predictor of CPA risk than childhood violence was, since both adult attachment and CPA risk reflect current functioning, whereas childhood abuse is a historical variable. Despite the logic of this argument, however, childhood abuse has sometimes been found to be a stronger predictor of adult violence than was adult attachment (e.g., Wekerle & Wolfe, 1998). It is also possible that the association between adult attachment and adult CPA risk is stronger here because of shared method variance: whereas childhood violence was measured in terms of behavior, both attachment and CPA risk were measured in terms of subjective experience. This implies that associations between childhood violence and adult CPA risk would be stronger if both were measured in similar terms (either objective/behavioral or subjective/psychological).

The strength of the relationship between adult attachment and adult CPA risk observed in the present study is particularly impressive given that we assessed adult attachment in the context of respondents' general orientations to (implicitly peer)

relationships rather than in the context of parent-child relationships. Theoretically, adult attachment measured in the parent-child context would be expected to exhibit even stronger relations to childhood abuse and adult CPA risk than were observed in the present study. In practice, however, because existing measures of adult attachment differ in a number of respects, whether the same results would be obtained using different measures of adult attachment is an open question. Although some evidence suggests that most extant self-report measures of adult attachment tap the same two underlying dimensions (see Brennan et al., 1998; Feeney, Noller, & Hanrahan, 1994), individuals may have different attachment orientations for different attachment figures (Bowlby, 1980; Stein, Jacobs, Ferguson, Allen, & Fonagy, 1998). Different measures may thus result in disparate attachment classifications, particularly when self-report measures of adult attachment (assessed in a peer/romantic context) are compared with measures based on discourse analysis of semistructured interviews regarding childhood relationships with parents (notably the Adult Attachment Interview; AAI; George, Kaplan, & Main, 1985; see Crowell, Treboux, & Waters, 1999; for reviews see Crowell, Fraley, & Shaver, 1999; Stein et al., 1998). These differences between measures notwithstanding, attachment classifications based on the AAI have also been shown to be related to both history of abuse (e.g., Alexander, Anderson, Brand, Schaeffer, Grelling, & Kretz, 1998) and abusive behavior (Crittenden, Partridge, & Claussen, 1991).

In terms of the dimensions underlying adult attachment classifications, both self-attitudes and other-attitudes were significantly associated with adult CPA risk. The effects of the two dimensions were additive, such that those with positive attitudes toward both self and others (i.e., the securely attached) were at least risk and those negative attitudes toward both self and others (i.e., the fearfully attached) were at greatest risk of adult CPA perpetration.

However, consistent with the previous suggestion that attitudes toward self are more important than attitudes toward others (including the child) for predicting adult CPA risk (Milner & Crouch, 1999; Milner & Dopke, 1997), we found that self-attitude was the stronger of the two predictors. Thus, preoccupied individuals (marked by negative self-attitudes and positive other-attitudes) were at higher risk of adult CPA than were dismissing individuals (marked by positive self-attitudes and negative other-attitudes).

In research examining correlates of psychological adjustment and psychopathology, self-attitudes have also emerged as stronger predictors than other-attitudes (e.g., Alexander et al., 1998; Mikulincer, Florian, & Weller, 1993; Muller et al., 2000). Although self-attitudes appear to have stronger implications for both mental health and violent behavior than do other-attitudes, other attitudes may have stronger associations with other types of outcomes. For example, given that other-attitudes are more strongly associated with sociability than are self-attitudes (Bartholomew & Horowitz, 1991), other-attitudes may manifest stronger associations with outcomes involving interpersonal functioning and social support.

#### *Childhood Violence and Adult Attachment*

When examined independently, all forms of childhood violence were significantly (albeit weakly) associated with adult attachment. However, only CPA-p and DV remained significant once we controlled for demographics and associations among different forms of childhood violence (although the other three forms of childhood violence approached significance). It is not obvious why CPA should be more strongly related to adult attachment than is CSA. Nonetheless, the one previous study that examined this issue (Shapiro & Levendosky, 1999) reported the same result. It is even less clear why observed violence, in the form of DV, should have a more profound impact on attachment than does experienced

violence, in the form of CSA. These findings suggest that CPA and DV may be more disruptive to parent-child relationships, and have more negative effects on the child's working models of relationships, than does CSA. However, because it is not possible to equate the different types of childhood violence for severity (or different measures for validity and reliability) it would be premature to conclude that CPA and DV are stronger predictors of adult attachment than CSA, pending replication (preferably using diverse samples and measures).

Because parents are typically the primary attachment objects, we had predicted that parental forms of both CPA and CSA would have a stronger impact on adult attachment than would nonparental forms. The fact that parental forms of both CPA and CSA were found to be generally more severe than nonparental forms would also argue for a stronger impact of parental forms of abuse on both adult attachment and CPA risk. Although this prediction was supported for CPA, it was not supported for CSA. That is, CPA-p had a greater impact on both adult attachment and adult CPA risk than did CPA-n, but there was no consistent difference in the impact of CSA-p and CSA-n on attachment or adult CPA risk; if anything, CSA-n was a stronger predictor of CPA risk in the final model. This finding is at odds with the common assumption that CSA-phas more devastating effects, relative to CSA perpetrated by others (e.g., Elliott & Briere, 1992; Wind & Silvern, 1992), and we have no theoretical explanation for it. However, as noted above, given the relatively small numbers of respondents who reported CSA-p and CPA-n, the reliability of findings is likely to be lower for these than for the other forms of childhood violence.

### *Experimental Condition and Demographic Factors*

Unlike many previous studies in this area, we controlled for demographic differences between groups to establish that the observed relationships were not due to demographic confounds. We found several significant associations between demographic factors and childhood violence, attachment, and adult CPA risk variables. Importantly, however, demographic factors did not modify any of the observed associations. That is, relations among childhood violence, adult attachment, and adult CPA risk were similar for males and females, and regardless of respondent race, SES, marital status, age, or education level.

Our sample of U.S. Navy recruits complements previous research using high school student, college student, and community samples, representing a somewhat different stratum of American society. The sample was large and relatively diverse in many respects (e.g., SES, ethnicity, sex), although not in others (marital status, age). Relative to other samples, the naval recruits in our sample reported higher rates of childhood violence (Merrill et al., 1999; Merrill, Thomsen, Gold, & Milner, 2001), lower rates of secure attachment (cf. Brennan & Shaver, 1995; Coe et al., 1995; Feldman & Downey, 1994; Mickelson et al., 1997), and higher levels of adult CPA risk (cf. Milner, 1986). Despite these differences, we replicated (and extended) some effects previously documented, thereby providing evidence of the external validity of these effects.

### *Methodological Issues and Limitations*

We must acknowledge several limitations of our data and measures. First, our measures suffer from the same weaknesses that plague many self-reports, particularly those that deal with sensitive issues. Our measures of childhood violence were retrospective and, as such, subject to biases in recall. In addition, responses to any of our measures may have been

influenced by response biases such as social desirability. We took two steps to address these problems. First, we collected data under two different conditions (anonymous vs. identified) in an effort to examine the possible effects of response biases on our results. We found surprisingly few effects of this manipulation. More importantly, by including experimental condition as a factor in our analyses, we were able to ascertain that none of the observed effects of childhood abuse or adult attachment varied as a function of condition. Similarly, our results were identical regardless of whether we eliminated invalid protocols using the validity scales from the CAP Inventory. It does not appear that response biases played a major role in the present results.

Various measures of childhood violence, adult attachment, and adult CPA risk exist, each with its own strengths and weaknesses. CPA, CSA, and DV each encompass a broad range of experiences, and may not have been measured with sufficient precision to assess their full impact. Although we attempted to index the severity of each form of childhood violence in terms of its frequency of occurrence, other aspects of the experience (e.g., extremity) may be more important than frequency in determining the impact of childhood violence. With respect to adult attachment, as discussed previously, measures differ in several respects and classifications based on different measures may not correspond. The association between attachment and childhood violence might have been stronger if adult attachment had been measured with specific reference to relationships with parents or if attachment had been assessed in closer temporal proximity to childhood violence exposure. Finally, childhood violence and attachment were both assessed using a relatively small number of items; these measures are therefore likely to be less reliable than longer measures, such as the CAP Inventory.

In the present study we assessed risk of CPA perpetration rather than actual CPA perpetration. Objective behavioral measures of violence perpetration may initially appear preferable to self-report measures of violence risk. However, because many of our respondents were relatively young and most were childless, their opportunities to have previously committed CPA were limited. Behavioral measures of CPA perpetration are also likely to yield a nonrepresentative sample of abusers, in which those who inflict extreme forms of violence on children are likely to be overrepresented. In contrast, self-report measures like the CAP Inventory are likely to identify a broader range of individuals at risk of perpetrating CPA. Moreover, the use of self-report measures makes possible identification of potential abusers *before* they actually inflict harm upon another person, allowing for the possibility of preventative intervention. Of course, risk classifications based on the CAP are not isomorphic with behaviorally based classifications. Nonetheless, the two are highly related; scores on the CAP abuse scale are associated with a variety of specific risk factors for CPA perpetration, and scores differentiate nonabusers from abusers with 80 to 90% accuracy (Milner, 1986, 1994). Even when the CAP is administered to individuals before they become parents, it predicts their infants' outcomes (e.g., developmental delays: Dukewich et al., 1999; morbidity: Zelenko et al., 2001).

Because a great deal of evidence supports the validity of the CAP as a measure of CPA risk, we suspect that results obtained using an objective behavioral measure of CPA perpetration would be highly similar to those reported here. Nonetheless, because the two methods of assessing CPA risk have complementary strengths and weaknesses, replication of the current pattern of effects with a behavioral measure would increase our confidence in the reliability of these results. Similarly, the replication of the present research using alternate

measures of childhood violence and attachment (or ideally, using multiple measures of each), as well as samples drawn from different populations, would provide important evidence regarding the generalizability of our findings.

Finally, although we, like others in the field, conceptualize our model in terms of causal pathways between childhood violence and adult attachment, and between attachment and CPA risk, it is important to note that we have empirically demonstrated only correlational and not causal relations. Although it is logically impossible for violence experienced in childhood to be caused by attachment or CPA risk in adulthood, it is possible that other variables, not included in the model, account for these associations. Similarly, it is possible that attachment and CPA risk are not causally related, as we proposed, but rather two consequences of some other unmeasured cause. Given that experimental research on ITV cannot be conducted, efforts at establishing causation will ultimately require longitudinal research accompanied by measurement or control of other variables that constitute plausible causes or confounding variables with respect to the variables of interest.

### *Concluding Remarks*

Some researchers have suggested that the identification of mediators or moderators of the relationship between childhood abuse and detrimental outcomes is particularly likely to assist in the development of therapeutic interventions, because these factors are likely to be more readily modifiable than the abuse per se. We would like to broaden this concept to incorporate other predictors of negative outcomes, even if they are not mediators or moderators of the relationship between childhood violence and adult CPA risk. That is, any variable that predicts adult violence is a plausible candidate for intervention, regardless of whether it plays a role in ITV. Because insecure adult attachment is associated with adult

CPA risk, interventions that effectively increase the positivity of other-attitudes and (especially) self-attitudes may reduce adult CPA risk, regardless of whether the individual experienced childhood violence. This will occur, however, only if a causal relationship between adult attachment and adult CPA risk exists. Intervention research demonstrating that changes in a predictor, such as adult attachment, produce changes in an outcome, such as CPA risk, would thus constitute indirect support for the causal role of the predictor.

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Author Note

### Footnotes

<sup>1</sup>The research reviewed here is based on self-report measures of adult attachment. In a largely separate literature, adult attachment has been assessed using the Adult Attachment Interview (AAI), a semi-structured interview measure in which attachment classifications are based on discourse analysis rather than self-reports (George, Kaplan, & Main, 1985). Despite conceptual similarities between the two types of measures, there is mounting evidence that they do not assess the same constructs (e.g., Crowell, Fraley, & Shaver, 1999; Stein, Jacobs, Ferguson, Allen, & Fonagy, 1998). Therefore, research based on the AAI is not reviewed here. We address these issues more fully in the Discussion section.

<sup>2</sup>The high rate of noncompletion is likely due to the fact that the CAP Inventory items were the last items in a lengthy, professionally printed survey package that required approximately 3 hours to complete. Some individuals appeared to have lacked sufficient time to finish the survey package, whereas others may have chosen not to complete these items (as explicitly permitted by the informed consent form). Given that the male version of the survey was longer than the female version (35 vs. 31 pages), it is not surprising that males were more likely to provide incomplete data (39% vs. 19%),  $\chi^2(1, N = 11,195) = 536.75, p < .001, \phi' = .22$ , a small-to-moderate effect size. Although those who completed the CAP differed from those who did not in several other respects as well, the size of these effects was uniformly small. Rates of noncompletion were higher in the identified condition (31%) than in the anonymous condition (28%),  $\chi^2(1, N = 11,195) = 10.97, p < .01, \phi' = .03$ . In terms of demographics, those providing complete data were younger,  $t(10,729) = 2.93, p < .01, r = .03$ , higher in education,  $\chi^2(3, N = 11,164) = 13.73, p < .01, \phi' = .04$ , and more likely to be White,  $\chi^2(3, N = 10,951) = 183.66, p < .001, \phi' = .13$ . The two groups did not significantly

differ in SES or marital status. Noncompleters were also more likely than completers to report CPA-p (44% vs. 36%),  $\chi^2 (1, N = 10,333) = 47.85, p < .001, \phi' = .07$ , but were no more likely to report exposure to other forms of childhood violence. Finally, in terms of the attachment dimensions, completers had significantly more positive attitudes toward self than did noncompleters,  $t (9,978) = -2.84, p < .01, r = .03$ . The two groups did not differ in terms of attitudes toward others,  $t (9,978) = 2.08, n.s.$  Given the small magnitudes of these differences, we believe it is unlikely that our results were significantly skewed by differences between those who completed the CAP and those who did not.

<sup>3</sup>In addition to the five childhood violence variables (CPA-p, CPA-n, CSA-p, CSA-n, and DV), this analysis included an anonymity condition, and six demographic variables (sex, ethnicity, SES, age, marital status, and education). The inclusion of these additional factors allowed us to control for possible demographic confounds. Because of software limitations on the number of variables that could be included in the analysis, the analysis was conducted in two stages; each analysis included the childhood violence variables, anonymity condition, and a subset of demographic variables. Preliminary omnibus tests indicated that 4-way and higher-order interactions were not significant,  $\chi^2_{L.R.} (5,662, N = 7,474) = 1,927.53, p = 1.0$ ; therefore, only 3-way and lower-order interactions were considered. Even limiting our attention to 2- and 3-way interactions that involved at least one of the childhood violence variables, this analysis involved 230 separate statistical tests; therefore, to control the risk of Type I error, for this analysis only a more conservative  $\alpha$  value of .0001 was used to determine statistical significance. Had we retained  $\alpha = .01$  as our criterion for significance in this analysis, two additional partial  $\chi^2$  values would be significant (CPA-n with domestic violence and CSA-p with CSA-n).

<sup>4</sup>In the analysis in which respondents with invalid profiles were not excluded, the cohabitation effect only approached significance,  $b (SE) = 14.24 (5.97)$ , and two additional effects were significant; African Americans and those reporting their ethnicity as “other” scored higher than Whites on the CAP physical abuse scale,  $b (SE) = 8.96 (3.19)$  and  $13.20 (4.18)$ , respectively,  $p < .01$ .

Table 1

*Rates and Characteristics of Childhood Violence*

Type of abuse	Parental	Nonparental
CPA % (N)	38 (3,921)	5 (471)
Frequency <i>M</i> ( <i>SD</i> )	14.29 (19.94)	15.34 (22.43)
Frequency of injuries <i>M</i> ( <i>SD</i> )	8.23 (12.04)	5.08 (12.11)
CSA % (N)	4 (321)	17 (1,565)
Frequency <i>M</i> ( <i>SD</i> )	39.01 (56.80)	17.51 (40.32)
Use of force (%)	65	46
Intercourse (%)	70	63
DV % (N)	33 (3,452)	---
Frequency <i>M</i> ( <i>SD</i> )	10.37 (11.74)	---

*Note.* Descriptive statistics for characteristics of each type of childhood violence are based only on participants who reported that type of violence. CPA = childhood physical abuse; CSA = childhood sexual abuse; DV = domestic violence.

Table 2

*Zero-Order and Partial Associations Between Different Forms of Childhood Violence*

Type of violence	CPA-parental			CPA-nonparental			CSA-parental			CSA-nonparental		
	$\phi$	$\chi^2$	$\chi^2_{\text{partial}}$	$\phi$	$\chi^2$	$\chi^2_{\text{partial}}$	$\phi$	$\chi^2$	$\chi^2_{\text{partial}}$	$\phi$	$\chi^2$	$\chi^2_{\text{partial}}$
CPA-nonparental	.18	243.11	161.36									
CSA-parental	.10	73.37	26.67	.04	10.93	0.94						
CSA-nonparental	.14	144.52	66.30	.07	29.74	6.41	.12	69.99	9.38			
DV	.28	596.75	448.49	.09	68.66	9.95	.13	116.79	47.68	.15	148.57	49.33

*Note.* Values in boldface type are statistically significant ( $p < .01$  for zero-order coefficients,  $p < .0001$  for partial coefficients; see footnote 2). CPA = childhood physical abuse; CSA = childhood sexual abuse; DV = domestic violence. All  $\chi^2$  values are likelihood ratio  $\chi^2$  based on  $df = 1$ ,  $N = 7,474$ . Partial  $\chi^2$  values control for other forms of childhood violence as well as demographic variables. Phi ( $\phi$ ) coefficients are zero-order correlations and can be interpreted as effect size indices.

Table 3.

*Prediction of Adult Attachment Dimensions From Childhood Violence*

Type of childhood violence	Attitude toward self			Attitude toward others		
	<i>r</i>	<i>b</i>	<i>SE</i>	<i>r</i>	<i>b</i>	<i>SE</i>
CPA - parental	-0.10**	-0.69**	(0.11)	-0.05**	-0.31	(0.13)
CPA - nonparental	-0.05**	-0.61	(0.26)	-0.03*	0.03	(0.30)
CSA - parental	-0.05**	-0.64	(0.28)	-0.02	-0.04	(0.31)
CSA - nonparental	-0.03*	-0.32	(0.14)	-0.03*	0.01	(0.16)
DV	-0.07**	-0.32*	(0.12)	-0.03*	0.01	(0.13)

Note. *r*s are zero-order point-biserial correlations; *b* values are partial regression weights (controlling for demographics and for the other forms of childhood violence). CPA = childhood physical abuse; CSA = childhood sexual abuse; DV = domestic violence.

\* *p* < .01. \*\* *p* < .001.

Table 4.

*Prediction of Adult CPA Risk From Childhood Violence and Adult Attachment*

Set of predictor variables	<i>r</i>	<i>b</i>	<i>SE</i>
Form of childhood violence			
CPA - parental	.23**	35.49**	(3.49)
CPA - nonparental	.10**	21.35**	(8.32)
CSA - parental	.07**	17.47*	(6.69)
CSA - nonparental	.12**	28.81**	(6.52)
DV	.16**	16.16**	(2.83)
Adult attachment dimension			
Attitudes toward self	-.40**	-8.77**	(0.31)
Attitudes toward others	-.14**	-1.57**	(0.28)

Note. *r*s are zero-order point-biserial correlations for childhood violence and Pearson correlations for attachment dimensions; *b* values are partial regression weights (controlling for demographics and other forms of childhood violence in the analysis of childhood violence effects; controlling for demographics and the other attachment dimension in the analysis of attachment effects).

CPA = child physical abuse; CSA = child sexual abuse; DV = domestic violence.

\*  $p < .01$ . \*\*  $p < .001$ .

Table 5

*Correlations Among Variables Included in Path Model*

Variable	CPA-p	CPA-n	CSA-p	CSA-n	DV	Self	Others	CAP
CPA-parental	1.00							
CPA-nonparental	0.22**	1.00						
CSA-parental	0.10**	0.04	1.00					
CSA-nonparental	0.14**	0.06**	0.12**	1.00				
DV	0.34**	0.12**	0.15**	0.14**	1.00			
Attitudes toward self	-0.07**	-0.02	-0.02	-0.02	-0.07**	1.00		
Attitudes toward others	-0.06*	-0.04	-0.02	-0.03	-0.04	0.11**	1.00	
Adult CPA risk	0.24**	0.07**	0.06**	0.13**	0.18**	-0.40**	-0.14**	1.00

Note.  $N = 3,452$ . CPA = childhood physical abuse; CSA = childhood sexual abuse; DV = domestic violence.

\*  $p < .01$ . \*\*  $p < .001$ .

## REPORT DOCUMENTATION PAGE

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<b>14. ABSTRACT</b> (maximum 200 words) The present study examined the role of adult attachment in the intergenerational transmission of violence. We assessed the effects of exposure to several forms of childhood violence (child physical abuse (CPA), child sexual abuse [CSA], domestic violence [DV]) on adult CPA risk and examined whether adult attachment serves as a mediator or moderator of these relationships, or as an independent predictor of CPA risk. During their first week of basic training, U.S. Navy recruits ( $N = 11,195$ ) completed a package of questionnaires assessing childhood violence, adult attachment, and adult CPA risk. Childhood violence (especially parental CPA and DV) and adult attachment (especially the self-attitude dimension) were both predictive of increased adult CPA risk. Effects of childhood violence on CPA risk were partially but not entirely mediated by adult attachment. In contrast, there was no evidence that adult attachment or demographic factors moderated the relationship between childhood violence and adult CPA risk.		

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